Central and Southeast Texas Recreational Use-Attainability Analyses Project
Wickson Creek (Segment 1209E) Basic RUAA

Results Report

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Prepared by:
George Guillen & Jenny Wrast
University of Houston-Clear Lake

Principal Investigator
George Guillen

Environmental Institute of Houston
University of Houston Clear Lake
2700 Bay Area Blvd
Houston, Texas 77058

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TCEQ Contact:
Amanda Ross
Total Maximum Daily Load Team
Texas Commission on Environmental Quality
P.O. BOX 13087
Austin, Texas 78711-3087
512-239-6646
aross@tceq.state.tx.us

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Introduction

Problem Statement

Recreational Use-Attainability Analyses (RUAAs) are scientific assessments that are used to determine existing and attainable recreational use for a water body and determine if that use might be different than the presumed recreational use, as specified in the Clean Water Act. In September, 2009 a Basic RUAA was initiated on Wickson Creek, Segment 1209E. This Basic RUAA Report will provide the Texas Commission on Environmental Quality (TCEQ) Standards Group with relevant information to help determine the appropriate attainable recreation use for Wickson Creek. The completion of this Basic RUAA consisted of several important interrelated components including 1) reconnaissance and site selection, 2) Basic RUAA and 3) public outreach. The objectives of each component are listed below.

Objectives

1. Reconnaissance and Site Selection

The primary objective of this phase is to select survey sites that would be accessible to users and most likely characterize recreational uses in the watershed. This was accomplished primarily with the input of local, state and regional agency staff familiar with the watershed, as well examination of aerial imagery. An initial stakeholder meeting occurred on March 9, 2010 at the Navasota Center, Navasota TX. Reconnaissance surveys were conducted on January 14, 2010 and provided the basis for site selection for discussion in this meeting.

2. Basic Recreational Use Attainability Analysis

The primary objective of the Wickson Creek RUAA was to characterize the recreational use and potential impediments to use for this stream. The RUAA field surveys were conducted on the weekend of May 29, 2010, to collect information on the water body and associated uses.

During these dates, field surveys were conducted at selected sites with the highest probability of detecting recreation use. The objective was to document and characterize observed use, site conditions (hydrology, physical attributes), and weather during the survey the RUAA field surveys.

3. Public Participation

The objective of the public participation phase of the Basic RUAA was to solicit as much information from various watershed stakeholders including agency staff, citizens, recreational user groups, and other interested parties on the historical and current recreational uses in Wickson Creek. This included soliciting information on recreational uses by sending out emails to key organizations and staff familiar with the watershed. The stakeholder contact list is provided in Appendix 1. In addition, on March 9, 2010 a stakeholder meeting was held to gather information on the watershed including likely recreational access points.

Study Area

Description of Water Body

Wickson Creek is a tributary to the Navasota River watershed, which is located within the Brazos River Basin. Segment 1209E is an unclassified segment by the TCEQ and is approximately 33.2 miles in length. Segment 1209E begins at the confluence with an unnamed first order tributary (approximately 1.3 km upstream of Reliance Road crossing) and continues to the confluence with an unnamed first order tributary approximately 15 meters upstream of Dilly Shaw Road (TCEQ, 2008). Wickson Creek flows through flat terrain with local shallow dissections. Its clay and sandy loam soil supports live oak, mesquite, and hackberry, with some grasses (Handbook of Texas online, 2010). Wickson Creek is on the state's 303(d) list for

geometric mean values that exceed the bacteria criteria associated with primary recreation uses (TCEQ, 2008).

Environmental Features and Population Characteristics

The climate in the Navasota River Watershed is classified as having hot, humid summers and mild winters. Wickson Creek has been disturbed by human activities that have altered both the land use and vegetation cover of the watershed. These activities include the construction of roads and in-stream sewer lines, conversion of land for agriculture, and the building of commercial businesses and residential neighborhoods. The area can be described as rural with a very sparse population density.

Watershed Characterization

The Navasota River watershed traverses flat to rolling terrain with local shallow depressions, surfaced by clay and sandy loams that support water-tolerant hardwoods, conifers, and grasses. The riparian zone is minimally impacted by development. The watershed of Wickson Creek is predominantly rural with agriculture being the primary land use.

Permitted Discharges (Municipal, Industrial, Stormwater)

Wickson Creek is affected by storm water runoff from agricultural, industrial, and urban areas. Under TPDES, the TCEQ does not have any issued permits to discharge treated wastewater to the segment 1209E watershed.

Potential Nonpoint Sources

Potential sources of nonpoint source pollution in the watershed include on-site sewage facilities and runoff from agricultural lands. For any urban collection and treatment system, sanitary sewer overflows are possible sources of bacteria loadings to receiving waters. Wickson

Creek (Segment 1209E) watershed can be described as rural with no permitted waste water treatment facilities (WWTF). This fact suggests that there are potentially a high number of on-site sewage facilities (OSSFs or septic systems) in use in the watershed. OSSFs require routine repairs and maintenance to avoid failures causing potential leaks or overflows. Poorly maintained OSSFs are a potential source of bacteria loadings into Wickson Creek watershed.

Directly adjacent to Wickson Creek there are agriculture grazing tracts. These tracts at times provide livestock with direct access to the creek. Potential direct access was witnessed at reconnaissance sites 3, 4, 5, 6, & 8. Direct contact with agriculture grazing is a potential non-point source for Wickson Creek.

Site Reconnaissance Summary

Perspective sites were chosen based on public access and documented uses from the stakeholder response to the request for information e-mail which is included in Appendix 1. Initial reconnaissance surveys were conducted on January 14, 2010. A total of fourteen perspective sites were visited (Figure 1, Table 1). Two were on private property making them inaccessible and not recommended as survey locations. Recon sites 9 and 10 were in close proximity to each other. Access to site 9 was much more dangerous with blind corners, fast-moving traffic, and no shoulders, and made site 10 to be the better choice between the two. The remaining eleven sites were accessible and chosen for field survey sites (Figure 2, Table 2). Site suggestions were submitted to TCEQ as part of the Quality Assurance Project Plan's (QAPP) Monitoring Plan, which was approved by TCEQ on May 27, 2010.

Table 1. Site reconnaissance for Basic RUAA on Wickson Creek, Segment 1209E

Recon Site #	Description	Latitude	Longitude	Public Access	Water Access	Recommended Site?
1	Bickham Cemetary Rd @ Wickson Creek	30.83450	-96.37153	can park on side of road	very small banks	Yes
2	Francis Rd @ Wickson Creek	30.82520	-96.36824	can park on side of road	only water downstream, fence across upstream	Yes
3	Dick Elliot Rd @ Wickson Creek	30.81283	-96.36588	can park on side of road	low banks at road	Yes
4	FM974 @ Wickson Creek	30.79820	-96.36943	can park on side of road	low banks	Yes
5	Wilcox Ln @ Wickson Creek	30.76178	-96.34874	can park on side of road	gentle slopes, little vegetation	Yes
6	Dilly Shaw Tap Rd @ Wickson Creek	30.75699	-96.33890	can park on side of road	easy slopes	Yes
7	SH21 @ Wickson Creek	30.74179	-96.31737	can park on side of road	easy slopes, especially left	Yes
8	Old Reliance Rd. @ Wickson Creek	30.72637	-96.28580	can park on upstream side right or left bank	a little steep but manageable	Yes
9	FM 1179 @ Wickson Creek	30.72132	-96.25084	can park off Grassbur Rd - downstream, left bank	fenced all sides to bridge, no access	No
10	Grassbur Rd @ Wickson Creek	30.72106	-96.25241	can park on downstream right bank at gate	easy enough banks at bridge	Yes
11	C-6 Ranch Road @ Wickson Creek	N/A	N/A	Private	N/A	No
12	Elmo Weeden Rd. @ Wickson Creek	30.68826	-96.22154	can park on road	steep, possibly manageable	Yes
13	Weeden Loop @ Wickson Creek	30.65682	-96.20679	can park on side of road	manageable but steep	Yes
14	Unnamed road @ Wickson Creek	30.65038	-96.19971	Private	N/A	No

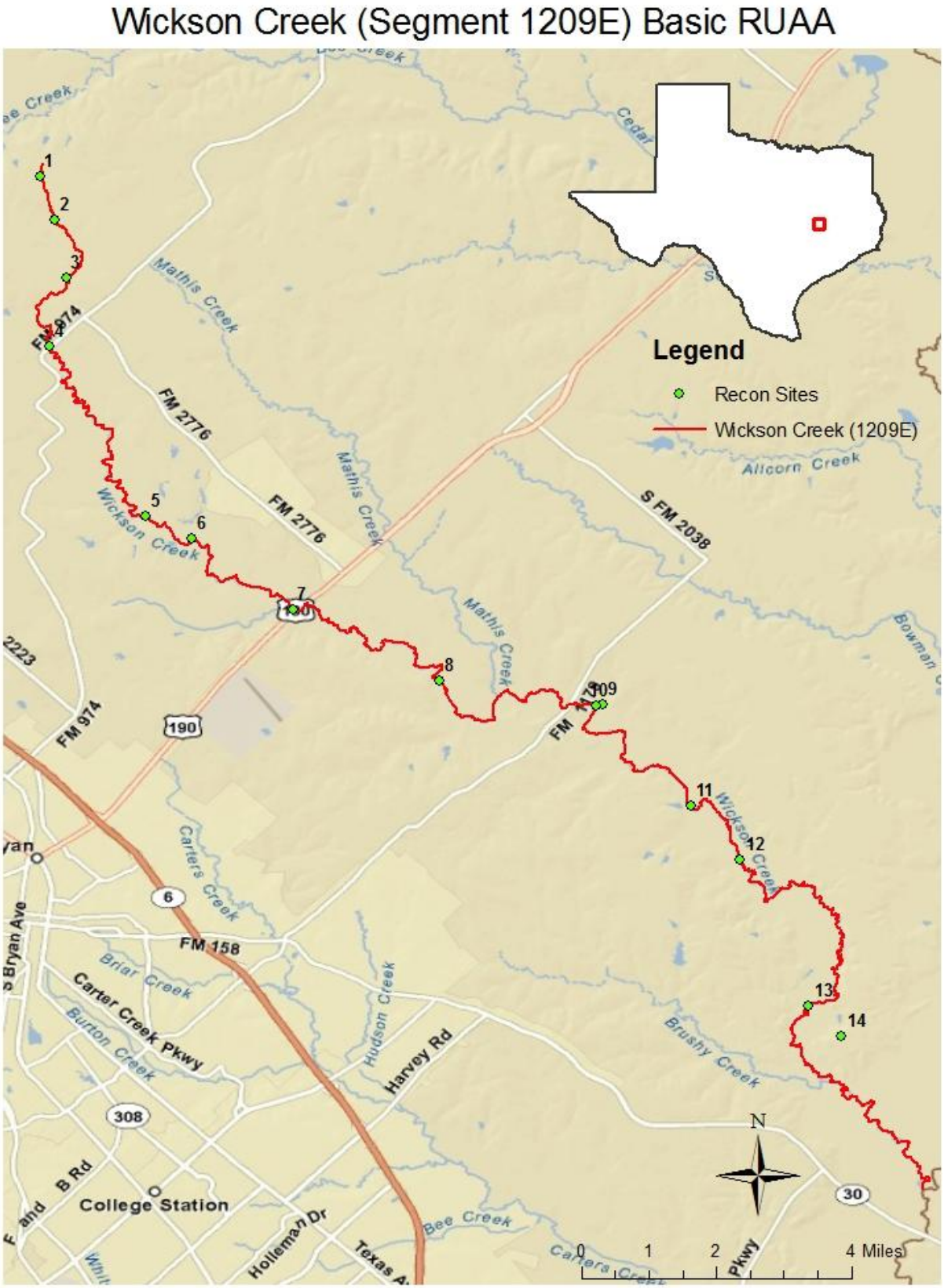

Figure 1. Basic RUAA reconnaissance sites on Wickson Creek, Segment 1209E. Recon site number 14 is marked at the entrance to the private property.

Methodologies

RUAA Survey Site Selection and Descriptions

Wickson Creek flows through mostly rural areas held by largely private property owners. The target density of survey sites should be approximately three (3) sites per every five (5) miles of stream (TCEQ 2009). During our study, survey sites were established in areas where the water body is accessible to the public and has the highest potential for recreational use (road crossings, public lands/parks located near the water body, and populated areas). A total of eleven (11) survey sites were established (Table 2 & Figure 2). These sites were chosen based on public access potential and also providing sufficient spatial coverage throughout the segment. In portions where the recommended three (3) sites per every five (5) miles of stream was not possible, supplementary information was gathered through coordination with local authorities, and using topographic maps and aerial photos.

Every effort was made to obtain supplementary recreational use information about the entire length of the segment, including areas other than the selected sites in this Basic RUAA. Topographic maps and aerial imagery were used to provide the needed geographic information about potential recreational opportunities, potential access points, and potential access obstacles along the Wickson Creek. Review of these resources resulted in reconnaissance site selection. The subsequent reconnaissance site visits confirmed the limited public access along the Wickson Creek. Fences, gates, and no trespassing signage are common public access limitations on the segment and resulted in less than three (3) sites for every five (5) miles of stream. Figure 3 depicts the range of variability of physical attributes found along Wickson Creek.

Table 2. Survey sites for the Basic RUAA Survey on Wickson Creek, Segment 1209E (corresponding to Figure 2 and Table 1)

Recon Site #	Field Survey Site #	Description	Latitude	Longitude	Approx. river mile
1	1	Bickham Cemetary Rd @ Wickson Creek	30.83450	-96.37153	32.1
2	2	Francis Rd @ Wickson Creek	30.82520	-96.36824	31.1
3	3	Dick Elliot Rd @ Wickson Creek	30.81283	-96.36588	30.0
4	4	FM974 @ Wickson Creek	30.79820	-96.36943	28.5
5	5	Wilcox Ln @ Wickson Creek	30.76178	-96.34874	23.9
6	6	Dilly Shaw Tap Rd @ Wickson Creek	30.75699	-96.33890	23.0
7	7	SH21 @ Wickson Creek	30.74179	-96.31737	20.7
8	8	Old Reliance Rd. @ Wickson Creek	30.72637	-96.28580	17.4
10	9	Grassbur Rd @ Wickson Creek	30.72106	-96.25241	14.2
12	10	Elmo Weeden Rd. @ Wickson Creek	30.68826	-96.22154	9.8
13	11	Weeden Loop @ Wickson Creek	30.65682	-96.20679	5.0

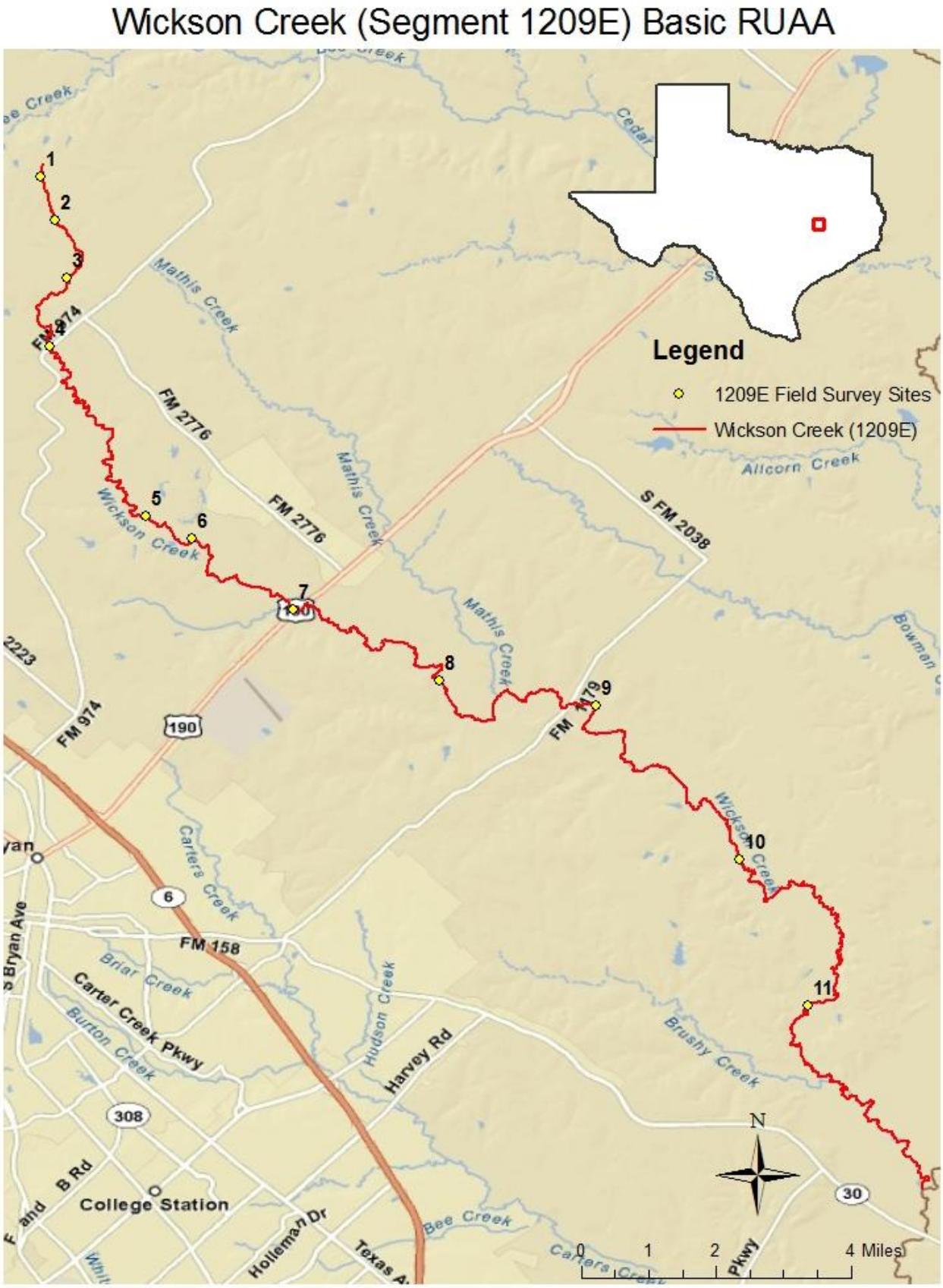

Figure 2. Basic RUAA survey sites on Wickson Creek, Segment 1209E, selections based on river mile/assessment units, accessibility, and recreational features

Figure 3. Pictures from field survey sites 2, 5, and 10 depicting the various physical attributes observed along Wickson Creek, Segment 1209E.

Sampling Methods

RUAAs are used to identify and assign attainable uses and criteria to individual water bodies. Applicable uses and associated criteria are defined in the Texas Surface Water Quality Standards (TSWQS). Until recently, Texas had two recreation use categories in the 2000 TSWQS: contact and noncontact recreation. These recreation use categories were expanded to include more categories: primary contact, and secondary contact recreation (1 & 2). Primary contact recreation consists of recreational activities involving a significant risk of ingestion of water including: wading by children, swimming, water skiing, diving, and surfing. Secondary contact recreation 1 is considered water recreation activities not involving a significant risk of water ingestion: including fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity. Secondary contact recreation 2 follows the same definition as secondary contact recreation 1, except that it occurs less frequently due to (1) physical characteristics of the water body and/or (2) limited public access.

According to TCEQ agency guidance, a Basic RUAA must be conducted on Wickson Creek since it is an unclassified water body (Segment 1209E). RUAA Surveys were conducted during the normal warm season and periods when people would be most likely use the water body for contact recreational purposes. RUAA Surveys were also conducted during optimal sampling conditions that are representative of the normal flow conditions of the stream and are not storm-influenced. RUAA field surveys for Wickson Creek (Segment 1209E) were conducted on Saturday and Sunday, May 29 and 30, 2010. Weather conditions for these days and the previous 30 days can be found in Appendix 4. More specific procedures can be found in *TCEQ's RUAA Procedures Document, May 2009.*

Field Survey Descriptions

A Basic RUAA field survey begins with marking off a 300 meter (m) reach of the waterway, flagging every 30m. Sites with public accessibility limitations may not be fully assessed in this way. In instances such as these, a laser range finder was used to document the length of the stream reach that could be observed. A flow measurement (where possible) was then taken within the 300m stream reach. If the waterbody is wadeable, a depth measurement was taken every 30m and width measurements were taken at the widest, narrowest, and average width points within the 300m reach. Pictures are taken to document the survey at 30, 150, and 300m facing upstream, right bank, downstream, and left bank (Appendix 3). Air temperature, water temperature, and secchi depth were also recorded at an easily accessible location. Finally the Basic RUAA datasheets were completed to document any recreational uses, signs of recreational use, impeding conditions, or other field notes taken during the field survey. The depth measurements for the sites that were considered non-wadeable were taken from the bridge at the deepest point accessible.

Due to impediments affecting stream access, complete field survey methods were not possible at some locations on Wickson Creek. Impediments to stream access, such as steep banks fences, log jams, and overgrown banks, at times limited the field survey team's ability to survey the complete 300m stretch of stream. In each case where this was a factor, the impediments were documented on the field data sheet and documenting pictures of these conditions were taken (Appendix 3). Specific impediments causing access constraints for each site can be found in Appendices 2 and 5.

Results

The field survey site visit was completed on each of the 11 sample sites on Saturday and Sunday, May 29 and 30, 2010. All field data sheets are attached (Appendix 2).

Physical Evaluation and Flow

During the field surveys, the air and water temperatures fell within the range of acceptable temperatures for sampling described in the TCEQ procedures manual (Table 3). The average depth of Wickson Creek was 0.69m and the average width is 4.19m. The average secchi tube reading taken at the field survey sites was 0.31m (Table 3). Field survey site 1 was dry, and there was no notable flow for sites 2-5 and site 8. The flow was taken at the remaining field survey site was 0.12 cubic feet per second (cfs). As seen in Table 3, the width and depth varied from relatively narrow and shallow to relatively deep and wide. It is evident that some portions can have episodes of have much higher flow and water levels due to the erosion along the banks exposing tree roots and the size and location of the debris littering the waterway.

Wickson Creek riparian zone can be generalized as mainly forest and pasture (Table 4). The dominant substrate along the creek was generally composed of mainly mud/clay with gravel sand and silt documented.

Recreational Uses

During the field surveys, there was no observed recreation on Wickson Creek (Segment 1209E). There was evidence of recreational use observed (foot paths/prints and graffiti) at field survey site 9 (Table 5, Figure 4, & Appendix 5). There were many noted impediments at every survey site along Wickson Creek that could limit recreation including: private property, steep slopes, fences, debris in the water, culverts, and log jams (Table 5, Figure 4, & Appendix 5).

Table 3. Physical parameters from the basic recreational use attainability analysis field surveys conducted on Wickson Creek, Segment 1209E * = creek was dry, ** = too shallow to take secchi reading

Site #	Site Description	Air Temperature (°C)	Water Temperature (°C)	Average Depth (m)	Average Width (m)	Stream Flow (cfs)	Secchi Tube (m)
1	Bickham Cemetary Rd	36.5	*	*	*	*	*
2	Francis Rd @ Wickson Creek	36.5	31.0	0.30	1.52	0.00	**
3	Dick Elliot Rd at Wickson Creek	30.0	25.0	0.26	3.65	0.00	**
4	FM 974 at Wickson Creek	32.0	28.0	0.73	2.53	0.00	Clear to Bottom
5	Wilcox Ln at Wickson Creek	33.0	30.0	0.73	8.50	0.00	0.30
6	Dilly Shaw Tap Rd. at Wickson Creek	34.5	29.0	1.25	1.52	0.17	0.26
7	SH 21 @ Wickson Creek	28.0	26.0	0.59	3.66	0.27	0.58
8	Old Reliance Rd @ Wickson Creek	Unable to access, Road Closure					
9	Grassbur Rd @ Wickson Creek	27.0	25.0	1.10	9.14	0.00	0.18
10	Elmo Weeden Rd at Wickson Creek	25.0	25.0	0.64	1.98	0.31	0.21
11	Weeded Loop @ Wickson Creek	34.0	26.0	0.59	5.25	0.47	0.31
	Total Average	**31.7**	**27.2**	**0.69**	**4.19**	**0.14**	**0.31**

Table 4. Physical characteristics of Riparian Zone and Dominant Substrate of the field survey sites sampled during the Basic Recreational Use Attainability Analysis on Wickson Creek, Segment 1209E

Site #	Site Description	Left Bank Riparian Zone	Right Bank Riparian Zone	Dominant Primary Substrate
1	Bickham Cemetary Rd	Forest	Forest	Gravel
2	Francis Rd @ Wickson Creek	Forest	Forest	Gravel
3	Dick Elliot Rd at Wickson Creek	Forest	Forest	Mud/Clay
4	FM 974 at Wickson Creek	Pasture	Pasture	Mud/Clay
5	Wilcox Ln at Wickson Creek	Pasture	Pasture	Mud/Clay
6	Dilly Shaw Tap Rd. at Wickson Creek	Forest/Urban	Forest/Urban	Mud/Clay
7	SH 21 @ Wickson Creek	Forest	Forest	Mud/Clay
8	Old Reliance Rd @ Wickson Creek	Unable to access: road closure		
9	Grassbur Rd @ Wickson Creek	Forest	Forest	Mud/Clay
10	Elmo Weeden Rd at Wickson Creek	Forest	Forest	Sand
11	Weeded Loop @ Wickson Creek	Pasture	Forest	Silt

Table 5. Observed evidence of recreational use and Impediments to recreational use documented on Wickson Creek, Segment 1209E, for the Basic Recreational Use Attainability Analysis. No recreation was observed during the Basic RUAA field surveys. See Appendix 5: Google Earth Interactive Map for exact locations of evidence and impediments.

Site #	Site Description	Impediments	Evidence
1	Bickham Cemetary Rd at Wickson Creek	Fence, Culvert	
2	Francis Rd at Wickson Creek	Culvert, Private property	
3	Dick Elliot Rd at Wickson Creek	Fence, Culvert, Private property	
4	FM 974 at Wickson Creek	Fence, Culvert	
5	Wilcox Ln at Wickson Creek	Fence	
6	Dilly Shaw Tap Rd. at Wickson Creek	Fence, Water control structure	
7	SH 21 at Wickson Creek	Rip rap	
8	Old Reliance Rd at Wickson Creek	Unable to access: road closure	
9	Grassbur Rd at Wickson Creek	Low bridge, Fence	Foot path/prints, Graffitti
10	Elmo Weeden Rd at Wickson Creek	Fence	
11	Weeden Loop at Wickson Creek	Fence, Log Jam, Steep Slope, Private Property	

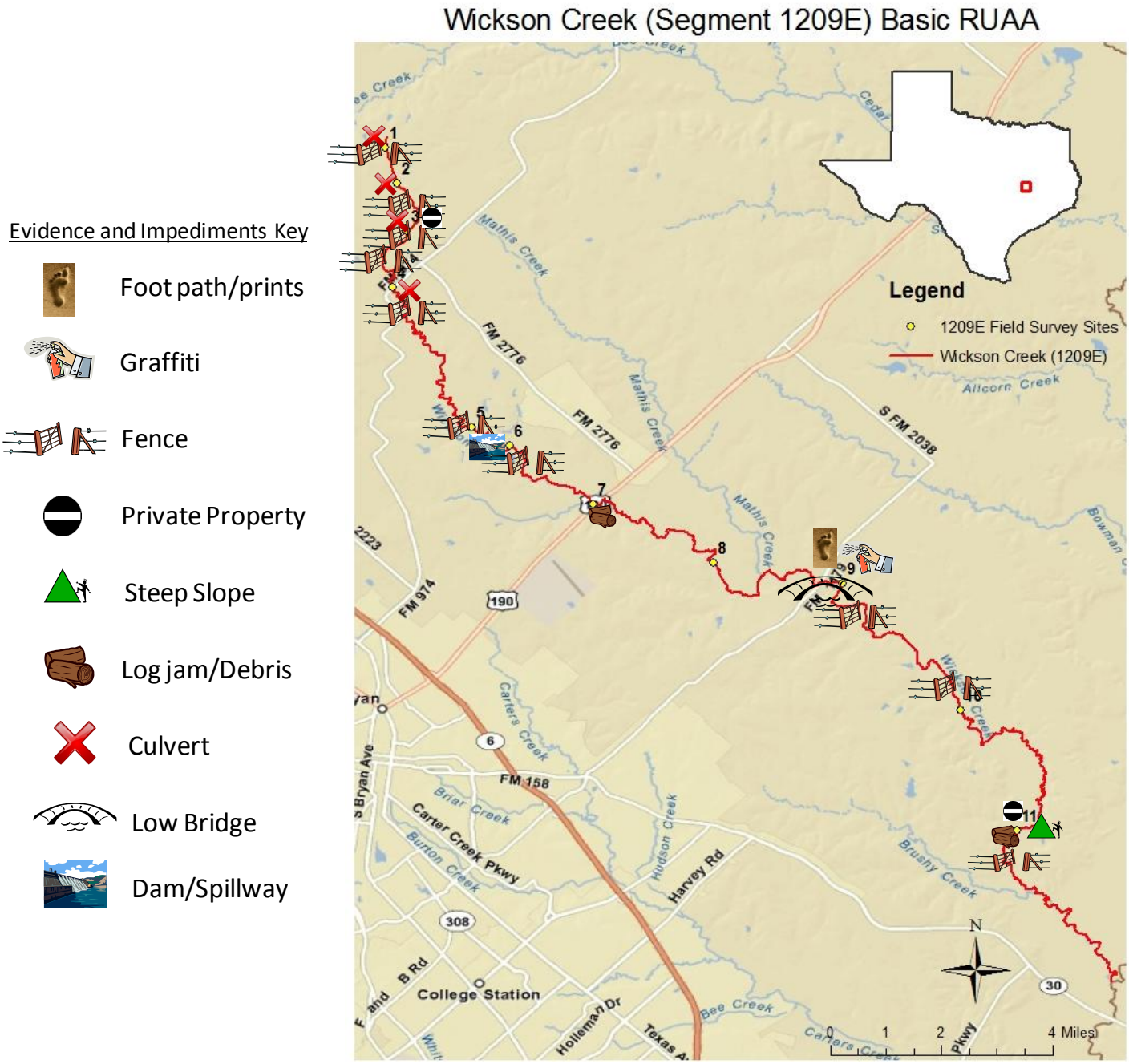

Figure 4. Basic RUAA survey sites on Wickson Creek, Segment 1209E, with depictions of observed evidence of recreational uses, and impediments. Locations are approximate. See Appendix 5: Google Earth Interactive Map for exact locations of evidence and impediments.

Summary

Ten (10) field surveys were completed on Wickson Creek (Segment 1209E) during this basic RUAA to evaluate whether the existing and/or attainable recreational uses of the creek might be different than the current presumed recreational uses. Important data collected in this RUAA included general stream characteristics, observations and evidence of recreational use, surrounding conditions that promote recreation, and surrounding conditions that impede recreation, including channel obstructions.

Numerous impediments to recreational uses were also noted during the field surveys, including but not limited to fences and log jams. During the field surveys, staff did not observe any form of recreation on Wickson Creek. Staff did observe evidence of human presence (foot prints/paths, graffiti) at one site. No primary contact recreation was documented during this Basic RUAA. The average thalweg depth was 0.69m and the average width was 4.19m. The average flow was 0.12cfs over the span of Wickson Creek. No public recreation areas in the form of maintained parks were found as part of this RUAA. Basic RUAA summary analysis indicates that non-contact recreation activities occur on Cedar Creek (Segment 1209G).

Literature Cited

Handbook of Texas Online. 2010. Texas State Historical Association (TSHA) web resource: http://www/tshaonline.org.

Texas Commission on Environmental Quality (TCEQ). 2008. Texas 303(d) list (March 19, 2008). TCEQ, Austin, Texas.

Texas Commission on Environmental Quality (TCEQ). 2009. Recreational Use-Attainability Analyses (RUAAs) Procedures for a Comprehensive RUAA and a Basic RUAA Survey. TCEQ, Austin, Texas.

RUAA Summary Form

RUAA Summary

This form should be filled out after RUAA data collection is completed. Use the Contact Information Form, Field Data Sheets from all sites, Historical Information Review, and other relevant information to answer the following questions on the water body.

Name of water body: __*Wickson Creek*_____
Segment No. or Nearest Downstream Segment No.: ____*1209E*_____
Classified?: __*No*_____
County: _____*Brazos*_____

1. Observations on Use
   a. Do primary contact recreation activities occur on the water body?
      ☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown

   b. Do secondary contact recreation 1 activities occur on the water body?
      ☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown

   c. Do secondary contact recreation 2 activities occur on the water body?
      ☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown

   d. Do noncontact recreation activities occur on the water body?
      ☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown

2. Physical Characteristics of Water Body
   a. What is the average thalweg depth? __*0.69*__meters

   b. Are there substantial pools deeper than 1 meter? ☐ yes ☐ no N/A

   c. What is the general level of public access?
      ☐ easy ☐ moderate ☐ very limited

3. Hydrological Conditions (Based on Palmer Drought Severity Index)
☐ Mild-Extreme Drought ☐ Incipient dry spell ☐ Near Normal ☐ Incipient wet spell ☐ Mild-Extreme Wet